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Wabamun Lake Watershed: Land Use Recommendations, Interim Progress Report, 1

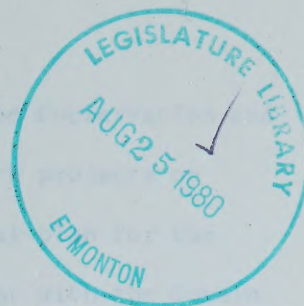


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WABAMUN LAKE WATERSHED:

LAND USE RECOMMENDATIONS

INTERIM PROGRESS REPORT



Prepared by the

Task Force

on

Wabamun Lake

for submission to the

Conservation and Utilization Committee

Task Force Membership:

H. W. Thiessen, Chairman
R. N. Giffen, Edmonton Regional Planning Commission
T. Mussivand, Water Resources Division
L. D. M. Sadler, Water Resources Division
and others as listed in report

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INTRODUCTION AND 1970 PROGRESS

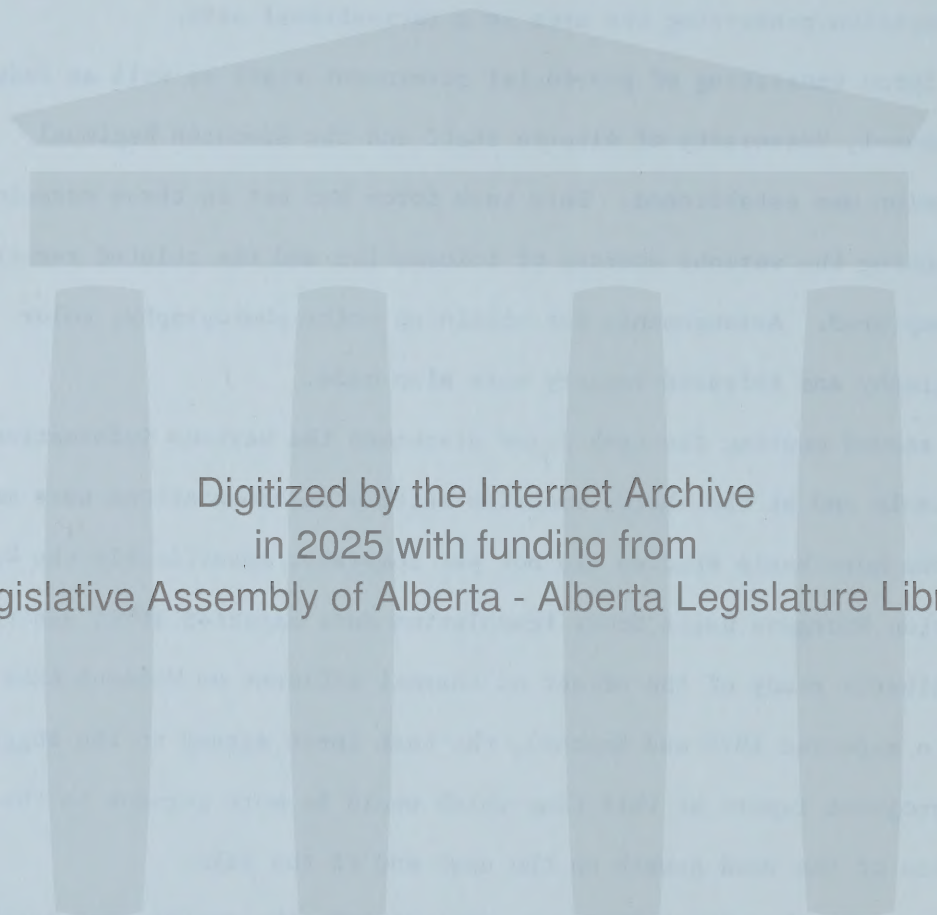
On February 26, 1970 the Executive Council instructed the Conservation and Utilization Committee to co-ordinate various studies and research projects on Wabamun Lake, in order that an integrated long term developmental plan for the general area would be formulated. This plan was to be consistent with the Government's policy decision preserving the area as a recreational site.

A task force consisting of provincial government staff as well as federal government personnel, University of Alberta staff and the Edmonton Regional Planning Commission was established. This task force has met on three occasions. At the first meeting the various sources of information and the related research projects were explored. Arrangements for obtaining color photography, color infrared photography and infrared imagery were also made.

At the second meeting the task force discussed the various information currently available and at the third, specific interim recommendations were made. Since some of the more basic studies are not yet complete, specifically the Water Resources Division Sturgeon Basin Study (completion date expected 1971) and the University of Alberta study of the effect of thermal effluent on Wabamun Lake (completion date expected 1972 and beyond), the task force agreed to the suggestion of an interim progress report at this time which would be more germane to the immediate problem of the weed growth on the east end of the lake.

The major work that the task force commissioned, the aerial photography which delivery date was 4½ months behind schedule, has proven quite useful to date although lack of interpretative skills within the government is restricting its full use. It is apparent that the technology of sensing is considerably more advanced than related interpretation abilities. Other steps are being taken by the Conservation and Utilization Committee to bridge this gap.

In all of the task force activities, the Calgary Power Company has co-



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operatively participated, both in staff time and funds for photography.

GENERAL STATEMENT

The task force is at present not prepared to definitively assess a singular cause of deteriorating lake and surrounding environs from a recreation use vantage point or the degree of impact. There are many forms of use and over-use which are having detrimental effects, however their effects appear to be accumulative rather than singular.

Lake eutrophication is accelerating noticeably throughout the lake. Eutrophication is a normal bio-chemical process hastened by increasing levels of energy per unit of environment. These increasing levels may consist of inputs of nutrients and thermal energy or decreases of water, or some complex interrelationships thereof. The sources of all the additional energy and nutrients, or the disappearance of water is at this point conjectural. Although some sources and resultant causes are identifiable, the complex bio-chemical interrelationships are not yet fully understood. The recommendations that follow are intended to provide advice to the amelioration of immediate problems and the guidance required to develop long term plans for the area.

RECOMMENDATIONS

A. Immediate Measures

1. Selected land acquisition by the Department of the Environment to:
 - (a) ensure adequate future access by the public to the lake for recreational purposes,
 - (b) provide lands required for the maintenance and development of their recreational potential anywhere within the drainage basin,
 - (c) prohibit and discourage additional sub-division in the area of the lakeshore.
2. The maintenance of public reserve lands and road allowances by the Edmonton Regional Planning Commission, the two Municipal governments and the

Department of Highways and Transport and their continued protection against disposal or permanent closure.

3. The elimination of all known deleterious waste products into the lake or surrounding environs. Continuous surveillance by the Department of the Environment to ensure:

- (a) implementation of the standards for waste disposal of all urban and municipal industrial systems,
- (b) implementation of standards designed to control industrial wastes,
- (c) reduction of the entry of agricultural waste from livestock impoundments near the lake by dyking and by relocation of sites as prescribed by regulation.

4. Regular monitoring by the Department of the Environment of the water quality to determine specifically sources of excess phosphates and phenolics as well as other provincial criteria being exceeded such as pH, odour numbers, etc.

5. The Department of Lands and Forests undertake the harvesting (cutting, removal and adequate disposal) of weeds in selected areas on an experimental basis to determine efficiency of harvesting, disposal problems, benefits and costs over a 2 - 3 year period. Operational costs of the experiment outside of Moonlight Bay to be assessed to industry, summer villagers and the public on the basis of property assessment or other pre-determined formula.

The task force, on the advice from the University of Alberta members, rejected the use of selective herbicide application on an experimental basis in conjunction with weed harvesting. Subsequent discussions with the Aquatic Plant Control Committee, the Conservation and Utilization Committee, the Minister of Lands and Forests and his Director of Parks, as well as

staff from the Calgary Power Company Ltd. and representatives from three summer villages have resulted in a government plan of purchasing and operating a harvester. In addition, Calgary Power is financially prepared to co-operate with the villagers in harvesting selected areas. A proposal from the Canada Department of Agriculture regarding the experimental use of herbicides to the Aquatic Plant Control Committee is being considered to complement the mechanical method of control. It is anticipated that this work would commence in June, 1971. Satisfactory arrangements between the University of Alberta staff and the Aquatic Plant Control Committee were made on March 5, 1971 in order that the testing of chemical herbicides would take place in Moonlight Bay during 1971.

6. The Department of the Environment undertake a survey of all sewage facilities in the water basin, particularly those situated close to the lake, to determine sources of effluent.

B. Developmental Proposals

7. Require complete waste disposal of all urban municipal and industrial systems by:
 - (a) technological adaptations to existing and required disposal systems,
 - (b) prevention of wastes entering the lake or its removal from the lake by transporting waste material to the mixed areas in order that the process of reclamation and land development using vegetation is enhanced.
8. Require upgrading of sewage facilities for all private residences if the survey of facilities called for in Part A (6) shows this need.
9. Land use which would encourage the establishment of permanent forage and/or tree cover to reduce organic runoff from agricultural fields.
10. Discourage land clearing within the drainage basin other than in

compliance to government land clearing guidelines as minimum restrictions.

11. Continuation of research into effects of thermal discharge from Calgary Power plants into Wabamun Lake:

- (a) continue investigations into ways and means to reduce the temperature of the water discharge used in plant cooling, preferably reducing the total thermal energy added to the lake concomitant with minimum water losses,
- (b) continuation of the long term study of effects of thermal addition on the lake biology as presently undertaken by the University of Alberta which includes the possibility of experimental dredging on a small scale.

Dr. J. R. Nursall, et al, University of Alberta, are requesting a \$46,500 research grant from the Department of Fisheries and Forestry (formerly Department of Energy, Mines and Resources- Inland Waters) to continue their ongoing work in describing and quantifying the effects of a temperature increase of 8 - 14⁰ C on the macrophytes, plankton and fish of a moderately eutrophic lake. General patterns of thermal effluent discharge have already been established and aquatic macrophytes have been mapped. Anticipated work includes precise current location and meteorological studies relative to biotic studies, detailed field and laboratory zooplankton and phytoplankton growth cycles and relationships and macrophyte studies on seasonal productivity and regeneration after clipping or dredging.

12. Continuation of studies regarding stabilization of lake level to within a predetermined range by reducing the degree of fluctuation, and examination of the various features of this suggestion such as sources of water, outlet facilities, and other engineering studies designed to measure the effect of adjustment on present land and water uses.

13. Pursue land use management in the entire watershed which will increase water yield uniformly throughout the year, e.g., tree planting, restrictive impoundments, etc.
14. Ultimate subsequent planned use of the mined areas prior to mining in order that sequential mining and reclamation procedures would lend themselves to that objective.
15. Negotiate the division of responsibility between Calgary Power and the government regarding future use, reclamation, and development in order to enhance the recreation potential.
16. Negotiate with Calgary Power regarding the future ownership status of the mined land.
17. Promote agricultural land use conversion from cultivated crops to forage crops and livestock production through grass seed and conversion grants throughout the drainage basin.
18. Encourage tree planting throughout the drainage basin by intensifying the availability of trees and waiving municipal tax payments on lands being rehabilitated for wildlife habitat.
19. Protect waterfowl nestings along the southeast corner of the lake.
20. Encourage the integration of land use policies of the Wabamun Indian Reserve lands adjacent to the lake to be complementary with provincial recreation goals by making provincial expertise easily available.
21. Declare the Wabamun Lake drainage basin as a conservation area, (Restricted Development Area) under the concepts of rational integrated land use and recreational land use, fully protected by provincial legislation applicable to public and private lands.
22. Declare the public lands of the Wabamun Lake area a regional park.
23. Lake management proposals should emphasize sport fishing as opposed to commercial fishing.

24. Pursue the industrial uses of the warmed waters, e.g., fish hatchery to provide lake stocking, artificial indoor fisheries, municipal uses, etc.
25. Rehabilitation, beautification and development campaign including all the private lakeshore residences.
26. Involvement of elected municipal officials prior to public discussions of proposals being considered by the government.
27. Public discussion groups and hearings to involve the residents of the area in order to encourage acceptance, participation and success of government proposals.
28. Continuation of the Wabamun Lake Task Force for monitoring and analysis of changing conditions until such time when the final plan is submitted.
29. Appropriation of research funds for unanticipated and/or currently initiated studies.

In fact, this is already being done by the Department of the Environment.
30. Research to determine the effects of surface mining on groundwater quality in the area, as well as the effect of groundwater streams on the recharging and discharging from the lake. The task force wishes this incorporated with recommendations for other kinds of research.

Three other suggestions were discussed by deferred at this time.

31. The application of sewage effluent, dredged sludge and harvested weeds to the graded spoil material to enhance soil nutrients for rapid regrowth of planted species in the reclaimed areas.

In deferring 31, the task force recognized the advisability of investigating this and remarked on experimental work taking place in other parts of the continent.

32. Explore the full potential of the mined areas for recreational pursuits of a wide variety to service a diverse demand from a cosmopolitan city

with Edmonton's growth characteristics, e.g., wildlife preserve, hunting reserve, fish ponds, fish farms, shooting and archery ranges, ski-doo and other all terrain vehicle proving grounds, ski slopes, grazing reserves, Christmas tree farms, wildlands, golf courses, toboggan runs, etc.

33. Provide encouragement and/or incentives (tax, loans, grants, title etc.) for private development capital of recreational facilities.

In deferring 32 and 33, the task force was of the opinion that further policy direction from the government on the question of future land ownership, incentives and government involvement was required prior to making specific proposals.

PLANS FOR 1971

It is hoped that the government will support the "A" recommendations in their entirety and indicate their approval in principle to the "B" recommendations which are consistent with projected government policy.

Specifically, the following activities are envisaged for 1971:

1. Controlled harvesting and herbicide testing to determine efficiency of operation.
2. Continuation of the University of Alberta studies to determine more definitively the impact of thermal effluent and related remedial measures to control the adverse effects.
3. Continuation of Calgary Power's studies to reduce the thermal effluent within acceptable provincial criteria.
4. Public meetings on the information gathered to date in relationship to lake level stabilization and the Sturgeon Basin Study in order that the public's response can be reflected in the provisional land use plan.
5. Interpretation of the data compiled during 1970 and 1971 in order that a land use plan of the entire basin can be synthesized for spring 1972 based on the

technical studies underway. Since the University of Alberta studies are the key to the problem, comprehensive progress is limited to their progress.

Although their work will continue for several years, it is hoped that sufficient information can be obtained during 1971 that a provisional plan can be formulated which may have to be altered in degree as further information becomes available from the zoological studies, but not requiring drastic changes in direction.

6. Preliminary drafting of proposed regulations if the government should see fit in establishing the Wabamun Lake drainage basin as a restricted development area. These regulations would translate the provisional land use plan into specified and regulated activities.

The task force will be called together during 1971 as required, although most of the work will be accomplished on an inter-agency basis now that their communications are established.

WABAMUN LAKE WATERSHED STATISTICS

1. LAKE CHARACTERISTICS

Drainage area	-	120	sq. mi.
Mean annual runoff	-	16,000	ac. ft.
Net evaporation loss	-	16,000	ac. ft.
Annual riparian flow	-	1,500	ac. ft.
Present annual consumptive use	-	1,900	ac. ft.
Lake surface area	-	32.6	sq. mi.
Lake shoreline	-	36.8	mi.
Lake depth	-	20	ft. (E); 35 ft. (W)
Lake level fluctuation	-	2,374.7	ft. Nov. 1961
	-	2,379.1	ft. May 1927

2. RECREATIONAL FACILITIES

	<u>Number of Facilities</u>	
	<u>On Shoreline</u>	<u>Off Shoreline</u>
Provincial Park	1	
Summer Villages	5	
Planned Subdivisions	20	
Dispersed Cottages	10	13
Community Halls		4
Recreation Park		1
Hotel		1
Sport Fields		1
Curling Rink		1
Library		1
Institutional Camps	6	
Yacht Clubs	3	

ADMINISTRATION

Counties of Parkland No. 31 and Lac St. Ann No. 28

	<u>Houses</u>	<u>Assessment</u>
Batula Beach, Kapasiwin, Lakeview,		
Point Allison and Seba Beach	976	\$2,749,580
Wabamun area	1,195	393,620
Unincorporated areas	<u>716</u>	<u>610,920</u>
Total residential	<u>2,887</u>	<u>\$3,754,120</u>
Calgary Power Ltd. (excluding equipment, powerline and pipelines)		3,448,410
Building Products of Canada Ltd. (wallboard panels and material)		106,470
Alberta Concrete Products		36,080
Western Fly-Ash Ltd. (drilling mud and cement)		<u>33,110</u>
Total industrial		<u>3,624,070</u>
Total		\$7,378,190

RECREATION DEVELOPMENT

Provincial Park	692 ac.	7,500 ft. shoreline
Public Parks	84 ac.	18,530 ft. shoreline
Summer cottages on lakeshore	317	55,750 ft. shoreline
Provincial Park peak attendance	(1967)	512,976 persons
	day	13,188 persons
	day	3,297 vehicles
	day	600 boats

WABAMUN LAKE TASK FORCE MEMBERS

H. W. Thiessen	Chairman, Conservation and Utilization Committee
Mr. L. Beres	Alberta Recreation Committee
Drs. D. N. Gallup & J. R. Nursall	Zoology Department, University of Alberta
N. Giffen	Edmonton Regional Planning Commission
N. M. McGinnis	Development Officer, Department of Indian Affairs
E. E. Kupchanko	Environmental Health Division
P. D. McCalla	Department of Agriculture
T. Mussivand	Water Resources Division
J. J. Nowicki	Forest Land Use Branch, Department of Lands and Forests
M. J. Paetz	Fish and Wildlife Division, Department of Lands and Forests
Dr. D. Pluth	Soil Science Department, University of Alberta
J. L. Reid	Water Resources Division
L. D. M. Sadler	Water Resources Division
S. M. Scott	Canada Land Inventory
T. A. Drinkwater	Provincial Parks Branch, Department of Lands and Forests
R. A. Seaton	Department of Mines and Minerals - no longer a member of government. No replacement appointed.
W. D. Isbister	Department of Municipal Affairs

